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STUDIES OF EARLY SPECIMENS AND REPORTS OF ILEX VOMITORIA

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A recent paper (Schultes in Bot. Mus. Leaflet, Harvard Univ. 14 (1950) 97–105) has discussed the correct name of the yaupon, pointing out the reasons why *Ilex vomitoria* is the valid binomial for the species of holly which was the source of the famous “black drink,” the ceremonial emetic used by the Indians of the southeastern part of the United States until about the beginning of the nineteenth century. In this article, reference was made to several pre-Linnaean names and citations, but it was not found necessary to enter into a general consideration of the early collections in order to review the taxonomic and nomenclatorial history of the plant since 1753.

The notes and observations which we present in the following pages outline the results of our study of certain classical and early collections of *Ilex vomitoria*, upon which were based authentic and often-quoted reports of the use of the plant amongst the aborigines. It is hoped that these notes may contribute to our understanding of the ethnobotanical history of this caffeine-bearing holly as well as afford further clarification of certain technical points in the early nomenclatorial and taxonomic studies of the plant.

We have been fortunate in finding a wealth of pre-Linnaean material preserved in the British Museum (Natural History) to

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the officers of which institution we are grateful for permission to examine the collections in question.

The earliest "description of the source of the emetic and stimulant drink of the Indians of Florida can be found in the account of the purification ceremony written down by Nuñez Cabeça de Vaca (*Relación y comentarios . . .*)" and published in 1542. A facsimile of the page bearing this earliest report was recently published (Schultes: *loc. cit.* t. 24). The drink, it was stated, was prepared from the leaves of trees resembling the live-oak ("las hojas de los árboles como de enzina . . ."). It should be noted that no common or native name for the plant was reported. No specimens are known to have been collected by this early expedition, even though numerous references were made to the plants and animals of the new lands.

The earliest use of the native name *cassine* in reference to the plant appears to be in the report of Narváez, who, in 1536, met with the drink amongst the Indians along the coast of Texas. In writing of the drink and of its uses, Narváez states (Hakluyt: "Principal Navigations Voyages Traffiques and Discoveries of the English Nation" 8 (1904) 454):

"Afterwards he [the tribal leader] commandeth Cassine to be brewed, which is a drinke made of the leaves of a certaine tree. They drinke this cassine very hotte; he drinketh first, then causeth to be given thereof to all of them one after another in the same boule . . .

Moreover, this drinke hath such a vertue, that as soone as they have drunke it, they become all in a sweate, which sweate being past, it taketh away hunger and thirst for four and twenty houres after."

Although Narváez gave no description of the source of the drink beyond stating that it was made from the "leaves of a certaine tree," his account is noteworthy because it is apparently the earliest use of the native name in connection with the plant, and the often-quoted report of the great hunger-and thirst-allaying properties was here set forth for the first time.

De Laudonnière, who led a Huguenot expedition to Florida in 1564, found the same ceremonial emetic in use amongst the Indians of the St. Johns River. His chronicler, Le Moyne, wrote ("*Indorum Floridam provinciam inhabitantium eicones . . .*" (1591) t. 29) that the drink, which was referred to as *cassine*, was made "from the leaves from a certain root." He gives no further description, nor were specimens gathered and

preserved for posterity. It is to Le Moyne, however, that we are indebted for a charming drawing of the ceremonial quaffing of the black drink during an Indian council (plate 1181).

From this extremely meagre knowledge of the source of a beverage for which such astounding properties were claimed and around the use of which such curious ceremonies had grown up, there was little advance for nearly two centuries. Even Bauhin, when he published his "Pinax" ((1623) 170), had no specimen at hand and was unable to describe or name the plant. He merely stated in this book: "Casina herba e cujus succo potionem coficiunt in Florida, quam bibunt in locum periculosum se conferunt, quo famen e sitim per horas 24 tollunt; para 2, Amer. navig. 4." This was repeated by Bauhin and Cherler in 1651 in their "Historia plantarum universalis" (3 (1651) 631), but still no description was offered. A. P. de Candolle's index of the Bauhin Herbarium at Basle (Bull. Herb. Boissier, ser. 2, 4 (1904) 752) listed only *Ilex Aquifolium*, so it is probable that Bauhin had never seen the plant and that his entire report was based on Narváez's account.

The earliest illustration of *Ilex vomitoria* which we have discovered is that published by Leonard Plukenet in 1705. A description of the plant in question was offered by Plukenet in 1700: "*Cassine vera Floridanorum Arbuscula baccifera Alaterni ferme facie, foliis alternatim sitis, tetrapyrene*" (Almagesti Botanici Mantissa (1700) 40). This description was followed by an illustration five years later ("Amaltheum Botanicum" 4 (1705) t. 376, f. 2). We have examined the Plukenet collection preserved in the Sloane Herbarium at the British Museum (Natural History) and find two specimens of *Ilex vomitoria*; one in Herb. Sloane No. 93 (p. 87); the other in Herb. Sloane No. 87 (p. 85). The latter specimen is a small fragment; the former is a good branching sprig from which, it is at once obvious, the Plukenet illustration was made. The illustration is an exact copy, published in reverse, of the sprig. Furthermore, this specimen is labelled, in Plukenet's own writing, with a statement that it represented "T.376, f.2", so this may be considered to be his personal testimony as to the source of the drawing.

In Plukenet's own copy of "Almagestum Botanicum" (1691), preserved in the library of the British Museum, there is a margi-

nal insert, in Plukenet's hand, on page 90 (between *Castanea sativa* and *Catsjan-Panel*) of the entire discussion and description of *Cassine vera Floridana* . . . which was later incorporated in the 1700 edition of "Almagesti Botanici . . ." Therefore, the earliest real botanical description based upon a specimen to which we may refer to-day was published in 1700, the first illustration, based upon an herbarium specimen, dated from 1705³.

It is of great interest to note here that in the "Amaltheum Botanicum," in which volume the illustration of *Cassine vera Floridana* was published, there is no reference whatsoever to the plant in the text and that in the text reference to "Cassine vera Floridana" (or *Ilex vomitoria*) in the "Almagesti Botanici Mantissa," no reference whatsoever is made to the use of the plant in preparing a drink. There is, however, in the text of this volume a note which states that "*Cassine altera Floridana, folio Alaterni Hysicanensis aemulo* . . ." was used to make a drink like tea and which appears nearly equal in its powers ("e foliis hujus arboris potum Theae similem, & viribus fere parem, conficere dicuntur"). For this plant, Plukenet refers to t. 377, f. 4. The figure is an exact drawing of a specimen mounted on page 87 of the Sloane Herbarium Book No. 93, directly opposite the species of *Ilex vomitoria* and is referable to *I. Cassine* L., the dahoon holly. This is of the utmost significance, inasmuch as it is the first reliable botanical evidence that *Ilex Cassine* L., a species very distinct from *I. vomitoria* (one synonym of which is *I. Cassine* Walt., as discussed in Schultes loc. cit. 98), was used in making a tea-beverage. It must be borne in mind, however, that Plukenet did not state that this was the source of the ceremonial emetic which the Indians, from remote times, had employed in their councils.

There remains to discuss a curious occurrence in Plukenet's *Almagesti Botanici* when he refers to [*Ilex vomitoria* or] *Cassine vera Floridanorum*, with some doubt, a Cretan plant—"Abelicea s. Santalus adulterina." Plukenet's reference is to Bauhin's "Historia plantarum universalis" (1650) 490, which, in turn, was taken from Clusius' "Rariorum plantarum historia" (1601)

³ These dates were given as 1691 and 1692, respectively, in Schultes: Bot. Mus. Leaflet, Harvard Univ. 14 (1950) 99.

cccij. This plant, now called *Zelkova cretica* Spach, belongs to the *Urticaceae* and has, of course, nothing to do with *Ilex vomitoria*. He likewise reported as being the same as his "Cassine vera Floridanorum" the "Pseudosantalus Cretica abolicea dicta" on the basis of a drawing in Parkinson's "Theatrum Botanicum" cap. xlviij (1640); this plant likewise is referable to *Zelkova cretica*.

Petiver, an apothecary who lived from 1658 to 1718, amassed in London extremely interesting collections of plants, several sets of which are preserved in the Sloane Herbarium at the British Museum. An examination of these sets has revealed several points of interest. In the set included in the Sloane Herbarium Book No. 178 F. 10, there is a specimen numbered 19 and labelled "the true *Cassine* or *Carolina* Tea." Although Petiver's notes state that he believes it to be the same as the "yaupon" which, with its use by the Indians, Lawson described in his *Natural History of Carolina* (1718) 90, the specimen is definitely not *Ilex vomitoria*.

The name Carolina tea may, at that time, equally well have been applied to the aromatic *Symplocos tinctoria* (L.) L'Her., as shown by the specimen corresponding to Number 485 "*Thea Caroliniana* *Lauro Cerasi* fol." (Petiver: Mus. Petiver (1695) 42). The original label of the collector (Mr. Robert Rutherford, Surgeon) states: "Lawrell or Bayes bear a yellow flower in March and smell exceeding sweet." To this, Petiver has added, in his own handwriting, "*Thea Caroliniana*, MP485."

The specimen (Number 19) which Petiver has called "true Cassine" is a species of *Viburnum*. The leaves might be said superficially to resemble those of *Ilex vomitoria*, but that it cannot be an *Ilex* is attested by the regularly opposite placement of the leaves. There is, however, one separated leaf which is very definitely referable to *Ilex vomitoria* and which is mounted on the page next and very close to the sprig of *Viburnum*, so that there can be very little doubt that some confusion has occurred.

The specimen mounted next to this so-called "true Cassine"—Number 20—is likewise a *Viburnum* and can be referred rather definitely to *V. cassinoides*. This Petiver has called "Bitter Cassine or Cassio-berry Bush. Cassine Caroliniana, *Arbuti folio*," and he has further written that "this differs from the last

[i. e. Number 19] in having much larger and deeper notched leaves, growing opposite." This very definite statement would lead us to believe that specimen Number 19 did *not* have opposite leaves, in which case we are, we believe, justified in assuming that the sprig of *Viburnum* with opposite leaves was inserted in Number 19 wrongly. Coupling this reasoning with the presence in one of the several Petiver sets at the British Museum of one leaf which is unquestionably of *Ilex vomitoria* under Number 19, we are encouraged to believe that an error has been committed.

In both the Petiver and Plukenet collections in the Sloane Herbarium, specimens of *Viburnum* have been mounted in close proximity to specimens of *Ilex vomitoria*. Sometimes they have been annotated as "another kind of Cassine" and, as we have seen, in several Petiver collections, even a twig of a *Viburnum* has been substituted, through error, in the place for *Ilex vomitoria*. This combination of circumstances might easily lead us to one of several conclusions: (1) the herbalists were trying to indicate merely a similarity between the *Viburnum* and the *Ilex* which, in the field, could attract attention or be the source of erroneous reports; or (2) they might have been suggesting (although they never state so) that a species of *Viburnum* was used together with the *Ilex vomitoria* or in its place.

In connection with the possible use of a *Viburnum* in preparing the black drink, it may be relevant to refer to a statement by Rafinesque (Med. Fl. 1, p. 9), who wrote that the weak infusion of the leaves of the "true casseena" are

"... useful in stomach fevers, diabetes, small-pox, etc. as a mild emetic, but the Indians *black drink* is a strong concoction of them, and a violent, though harmless, vomitive. In North Carolina, the inhabitants of the sea side swamps, having no good water to drink, purify it by boiling it with a little casseena (perhaps *Viburnum cassinoides*) and use it constantly warm, as the Chinese do their daily tea. *I. Dahoon* and *I. Cassine* are used as substitutes for the casseena, and many other shrubs appear to be used indiscriminately for making the black drink: for example, the *Cassine ramulosa*⁴ of the *Flora of Louisiana*. The use made of the leaves in Carolina or Florida by the native Indians has given rise to the opinion that this species was the Paraguay tea mentioned in Martyn's *Miller*, on the authority of M. Frazier; but the species which produces that article is the *I. paraguariensis* Lam. *I. vomitoria* is not very common in British collections. . ."

⁴ A mere synonym of *Ilex vomitoria*.

This passage would, at first reading, give one the impression that perhaps many plants entered into the preparation of the black drink. Closer study, however, reveals a deep confusion in Rafinesque's mind. First, he says that *casseena* is perhaps *Viburnum cassinoides*; whether this is based on actual observation in the field or upon the suggestiveness of the specific epithet is not clear. Then, secondly, he states that *Ilex Cassine* L. (*I. Dahoon* Walt.) and *I. vomitoria* (*I. Cassine* Walt.) are used as substitutes for the *casseena*. Furthermore, thirdly, he speaks of "many other shrubs" which are used indiscriminately, and, as an example, he cites a *synonym* of *Ilex vomitoria*! In view of this uncertainty and of the general confusion characteristic of much of Rafinesque's work, we believe that this report of the use of numerous species in the manufacture of the black drink cannot be taken too seriously. We have considered it in detail here inasmuch as apparently most of the present reports which attribute the source of the cassine tea to several or more plants stem directly from Rafinesque's passage.

In none of the old collections and reports which we have examined is there reliable and directly stated evidence that any plant other than *Ilex vomitoria* was the widely employed source of the black drink. Not even the closely allied *Ilex Cassine* L. or *dahoon* can be pointed to as a possible source. As has been shown (Schultes, loc. cit.), endless confusion and uncertainty has resulted from the unfortunate application of the specific epithet *Cassine* by Linnaeus to a plant which is not the cassine but the *dahoon* and from the application of the same specific epithet shortly thereafter to the true cassine. Most chemical analyses which have been made are of extremely limited value since we cannot be certain whether the name "Ilex Cassine," which the chemists use to identify their material, refers to the cassine or to the *dahoon*. The only chemical studies of apparently accurately-determined material seem to be those of Power and Chestnut (in Journ. Amer. Chem. Soc. 41 (1919) 1307), who were cognizant of the nomenclatorial confusion surrounding the binomial "*Ilex Cassine*" and who definitely state (l. c. 1308) that "the *Ilex Cassine* of Walter (but not of Linné) is the *Ilex vomitoria* Aiton, and, as we have shown, it is only the species to which the latter name is now assigned which contains caffeine."